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**(A) Lesson Objectives:**

- a. Introduce the meaning of Scientific Notation.
- b. Practice working with Numbers in Scientific Notation.
- c. Investigate several applications involving numbers in Scientific Notation.

**(B) Investigations for Classwork: Meaning of Scientific Notation → Large Numbers:**

- a. Rewrite 100 as multiples of 10: \_\_\_\_\_.
- b. Rewrite 10,000 as multiples of 10: \_\_\_\_\_.
- c. Rewrite 1,000,000 as multiples of 10: \_\_\_\_\_.

So the key idea with scientific notation is we are rewriting large numbers as \_\_\_\_\_.

- d. Rewrite 50,000 as multiples of 10: \_\_\_\_\_.
- e. Rewrite 51,000 as multiples of 10: \_\_\_\_\_.
- f. Rewrite 51,243 as multiples of 10: \_\_\_\_\_.

**(C) Investigations for Classwork: Meaning of Scientific Notation → Small Numbers:**

- a. Rewrite 0.01 (1/100) as multiples of 0.1 (1/10): \_\_\_\_\_.
- b. Rewrite 0.001 (1/1000) as multiples of 0.1 (1/10): \_\_\_\_\_.
- c. Rewrite 0.0001 (1/10000) as multiples of 0.1 (1/10): \_\_\_\_\_.

So the key idea with scientific notation is we are rewriting small numbers as \_\_\_\_\_.

- d. Rewrite 0.005 as multiples of 0.1: \_\_\_\_\_.
- e. Rewrite 0.0052 as multiples of 0.1: \_\_\_\_\_.
- f. Rewrite 0.0052436 as multiples of 0.1: \_\_\_\_\_.

**(D) Algebraic Examples of Converting numbers to and from SN – In Class → Express each in Scientific Notation and write the equivalent expression in  $aEx$  form.**

- a. 92960000 (Miles between Earth and Sun): \_\_\_\_\_.
- b. 300 million (Population of the US): \_\_\_\_\_.
- c. 0.000000000753 (kg-mass of a dust particle): \_\_\_\_\_.

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**(E) Algebraic Examples of Operating With Numbers in SN – In Class**

- a.  $(8 \times 10^6) \times (2 \times 10^2) =$  \_\_\_\_\_.
- b.  $(5 \times 10^{-2}) \times (3 \times 10^7) =$  \_\_\_\_\_.
- c.  $\frac{4.2 \times 10^6}{2 \times 10^2} =$  \_\_\_\_\_.
- d. The distance from Earth to the Sun is  $9.296 \times 10^7$  miles. The distance from Mars to the sun is  $1.413 \times 10^8$  miles. How many miles further from the Sun is Mars than Earth?
- e. The Population density of a region is the number of people per square mile and is calculated by finding the ratio of the population to the land area. The Earth's population is  $6.5 \times 10^9$  and has a land area of  $5.8 \times 10^7$  square miles. Find the population density. Include units.
- f. A human red blood cell is approximately  $9 \times 10^{-3}$  mm in diameter. Approximate, in mm, the width of  $8.2 \times 10^4$  cells if they are positioned side by side in a line.
- g. The area of the United States is approximately 65 times larger than the state of New York. If NY is  $5.4475 \times 10^4$  square miles, approximate the number of square miles contained in the entire US?
- h. The diameter of a U.S. quarter is  $2.41 \times 10^{-2}$  m and the diameter of Earth is  $1.2753 \times 10^7$  m. How many quarters would it take, placed side by side, to reach across the Earth's diameter?

**(F) Homework/Resources**

- **HW:**

- o <http://www.kutasoftware.com/FreeWorksheets/Alg1Worksheets/Writing%20Scientific%20Notation.pdf>
  - o <http://www.kutasoftware.com/FreeWorksheets/Alg1Worksheets/Operations%20Scientific%20Notation.pdf>
- Video help from OnlineMathLearning with inequalities:
- o <http://www.onlinemathlearning.com/scientific-notation.html>
  - o <http://www.onlinemathlearning.com/scientific-notation-3.html>
  - o <http://www.onlinemathlearning.com/scientific-notation-5.html>
- Reading from PurpleMath → <http://www.purplemath.com/modules/exponent3.htm>